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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/577,593	05/25/2000	Hideki Fujino	1086.1116/JDH	7150

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EXAMINER
SHARON, AYAL I

ART UNIT	PAPER NUMBER
2123	

DATE MAILED: 06/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/577,593	FUJINO, HIDEKI	
	Examiner	Art Unit	
	Ayal I Sharon	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 May 2000* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 May 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Introduction

1. Claims 1-22 of U.S. Application 09/577,593 filed on 5/25/2000 are presented for examination. The application claims priority to Japanese Application 11/320,662 filed on 11/11/1999.

Claim Objections

2. Claim 22 is objected to because of the following informalities: "A method according to Claim 12 ...". Claims 12-21 are method claims with equivalent limitations and equivalent claim dependencies as system Claims 1-10. Examiner therefore assumes that Claim 22, with its limitations that are equivalent to system Claim 11, also has the equivalent claim dependencies and there depends from Claim 21 and not Claim 12. Examiner assumes that there has been a typographical error and has examined the claims accordingly. Appropriate action is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The prior art used for these rejections is as follows:

5. Norita et al., U.S. Patent 5,668,631. (Henceforth referred to as "**Norita**").

6. The IEEE Standard Dictionary of Electrical and Electronics Terms, 6th Edition. 1996. pp.994-995. (Henceforth referred to as "**IEEE Dictionary**")

7. The claim rejections are hereby summarized for Applicant's convenience. The detailed rejections follow.

8. **Claims 1-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Norita in view of IEEE Dictionary.**

9. In regards to Claim 1, Norita teaches the following limitations:

> a model creation unit for creating a three dimensional optical model in which one or more optical components are disposed on an optical path extending from a light source to a final arrival position; and
> (Norita, especially: Figs.58-63 and associated text)

> an optical axis auto-creation unit for figuring out optical axes indicative of behaviors of beams of light in said three-dimensional optical model on the basis of predetermined set parameters, said optical axis auto-creation unit providing displays of said optical axes in said three-dimensional optical model, for verification.
> (Norita, especially: Fig.48, Items 263, 271, 279, 283; Figs.36-37; Fig.41; 58-63; and associated text)

However, Norita teaches a "real life" measuring system, and not its "simulation CAD system" equivalent, that is claimed in the preamble:

> 1.An optical path simulation CAD system comprising:

IEEE Dictionary, on the other hand, teaches in its definition for the term "simulator" (p.995) that a simulator is:

> A device used to represent the behavior of a physical system by virtue of its analogous characteristics. In this general sense, all computers are, or can be, simulators. However in a more restricted definition, a simulator is a device used to interact with, or to train, a human operator in the performance of a given task or tasks.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Norita with those of IEEE Dictionary because "a simulator is a device used to interact with, or to train, a human operator in the performance of a given task or tasks" (IEEE Dictionary, p.995).

10. In regards to Claim 2, Norita teaches the following limitations:

> 2. A system according to claim 1, wherein
> said optical axis auto-creation unit defines the
> optical axis diameter and the color of a beam of light
> emitted from said light source, said optical axis auto-creation unit creating and arranging a cylindrical optical axis model having a length starting from said light source and ending in an input surface of a next adjacent optical component lying on said optical path.
> (Norita, especially: Fig.26, Item 13; Fig.29, Items 11-117; Fig.41; Figs.45-48; Figs.58-63; and associated text)

11. In regards to Claim 3, Norita teaches the following limitations:

> 3. A system according to claim 2, wherein
> said optical axis auto-creation unit varies the
> optical axis diameter of said optical axis model as a function of the distance from the starting point.
> (Norita, especially: Fig.41; Figs.45-48; Figs.58-63; and associated text)

12. In regards to Claim 4, Norita teaches the following limitations:

> 4. A system according to claim 1, wherein
> for said optical component(s) interposed
> between said light source and a final arrival position,
> said optical axis auto-creation unit creates output
> side optical axis model(s) in conformity with optical
> functions of said optical component(s) from input
> optical axis model(s), to arrange said output-side optical axis model between said optical component and a next adjacent optical component or said final arrival position.
> (Norita, especially: Fig.41; Figs.45-48; Figs.58-63; and associated text)

13. In regards to Claim 5, Norita teaches the following limitations:

> 5.A system according to claim 4, wherein
> in case said optical component lying on said
> optical path is a movable reflecting mirror that is
> capable of swinging around a predetermined rotational
> axis, said optical axis auto-creation unit is able to
> designate as control parameters the position of said rotational axis and the angle of a reflection surface within a three-dimensional space, said optical axis auto-creation unit automatically creating and arranging reflected optical axis models from input optical axis models on the basis of said control parameters.
> (Norita, especially: Fig.41; Figs.45-48; Figs.58-63; and associated text)

14. In regards to Claim 6, Norita teaches the following limitations:

> 6. A system according to claim 4, wherein
> in case said optical component lying on said optical path is a polygon mirror that has a plurality of mirror faces formed on its periphery and that rotates at a certain angular velocity, said optical axis
> auto-creation unit previously defines the structures of said plurality of mirror faces, figures out the positions of said mirror faces within a three-dimensional space and the angles of the reflection surfaces from mirror rotational angles, and automatically creates and arranges an optical axis model reflected on a specific mirror face from an input optical axis model.
> (Norita, especially: Fig.41; Figs.45-48; Figs.58-63; and associated text)

15. In regards to Claim 7, Norita teaches the following limitations:

> 7. A system according to claim 1, wherein
> in case said optical component lying on said
> optical path is a lens, said optical axis auto-creation unit previously defines optical functions of said lens and automatically creates an output-side optical axis model in conformity with said optical functions from an input optical axis model, to arrange said output-side optical axis model between said optical component and
> a next adjacent optical component or an image forming
> face.
> (Norita, especially: Fig.41; Figs.45-48; Figs.58-63; and associated text)

16. In regards to Claim 8, Norita teaches the following limitations:

> 8. A system according to claim 1, wherein
> said optical axis auto-creation unit provides
> a display of an optical axis ending point at a position
> where an optical axis model intersects said final arrival
> face, said optical axis auto-creation unit recording coordinates of said ending point into a file.
> (Norita, especially: Fig.41; Figs.45-48; Figs.58-63; and associated text)

17. In regards to Claim 9, Norita teaches the following limitations:

> 9. A system according to claim 1, wherein said optical axis auto-creation unit defines a boundary wall model indicative of an optical axis extension limit around said three-dimensional optical model, said optical axis auto-creation unit if said optical path has no final arrival position providing an ending point, setting the position of said boundary wall model which said optical axis model intersects as an ending point of an extended optical axis model.
> (Norita, especially: Fig.41; Figs.45-48; Figs.58-63; and associated text)

18. In regards to Claim 10, Norita teaches the following limitations:

> 10. A system according to claim 1, wherein said optical axis auto-creation unit previously defines time-sequential variations of control parameters of said optical components lying on said optical path extending from said light source to an image forming face, said optical axis auto-creation unit allowing said three-dimensional model to perform continuous actions in accordance with said time sequential variations of said control parameters, to thereby display a desired ending point trace in the shape of, e.g., a letter or a symbol on a final arrival face and to record coordinates of said ending point into a file.
> (Norita, especially: Figs.47-53; and associated text)

19. In regards to Claim 11, Norita teaches the following limitations:

> 11. A system according to claim 10, wherein said optical axis auto-creation unit converts coordinate values of said ending point coordinates recorded in said file, into dot data, for the output from a printer.
> (Norita, especially: Figs.47-53; and associated text)

20. Claims 12-22 are rejected based on the same reasoning as Claims 1-11. Claims 12-22 are method claims reciting the equivalent limitations as are recited in system claims 1-11 and taught throughout Norita and IEEE Dictionary.

Conclusion

21. The following prior art, made of record and not relied upon, is considered pertinent to applicant's disclosure.

22. Leith et al., U.S. Patent 3,894,787.

23. Shioya et al., U.S. Patent 4,792,694.

24. Maney et al., U.S. Patent 5,243,665.

25. Steiner et al., U.S. Patent 5,268,996.

26. El Roy, A. et al. "Precision Single-Axis Motion Control System with Friction Compensation." Proc. Of the American Control Conf., 1995. June 23, 1995. Vol.5, pp.3299-3302.

27. Disko, D. et al. "Am29000 Thermal Evaluation in Laser Beam Printer Applications, In-System Real-Time Measurements for ICC and Power Calculations". 9th Annual Semiconductor Thermal Measurement and Management Symposium, 1993 (SEMI_THEM IX). Feb 4, 1993. pp.35-41.

28. Danzer, J. et al. "Installation and Testing of Laser Projection Imaging System for Fine-Line PCB Production". Proceedings, 52nd Electronic Components and Technology Conference, 2002. pp.681-685.

29. Kacker, D. et al. "Electrophotographic Process Embedded in Direct Binary Search". IEEE Transactions on Image Processing. pp.243-257.

Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ayal I. Sharon whose telephone number is (703) 306-0297. The examiner can normally be reached on Monday through Thursday, and the first Friday of a biweek, 8:30 am – 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin Teska can be reached on (703) 305-9704. Any response to this office action should be mailed to:

Director of Patents and Trademarks
Washington, DC 20231

Hand-delivered responses should be brought to the following office:

4th floor receptionist's office
Crystal Park 2
2121 Crystal Drive
Arlington, VA

The fax phone numbers for the organization where this application or proceeding is assigned are:

Official communications:	(703) 746-7239
Non-Official / Draft communications	(703) 746-7240
After Final communications	(703) 746-7238

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist, whose telephone number is: (703) 305-3900.

Ayal I. Sharon

Art Unit 2123

June 13, 2003

SAMUEL BRODA, ESQ.
PRIMARY EXAMINER